

NON-PUBLIC?: N  
ACCESSION #: 8808250234  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Zion, Unit 1 PAGE: 1 of 3

DOCKET NUMBER: 05000295

TITLE: Reactor Trip Due to Turbine Trip with Reactor Power > P-10  
EVENT DATE: 07/23/88 LER #: 88-017-00 REPORT DATE: 08/22/88

OTHER FACILITIES INVOLVED:  
FACILITY NAME: Zion, Unit 1 DOCKET #: 05000295

OPERATING MODE: 1 POWER LEVEL: 010

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Mike Winter, Tech Staff TELEPHONE #: 312-746-2084 Ext. 502

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On July 23, 1988, Unit 1 was being shutdown per Plant Shutdown General Operating Procedure (GOP) 4. Turbine and reactor power were both at approximately 5%, steam generator levels were at the low point of a diverging oscillation, and reactor coolant average temperature was approximately stable at 549 degrees F. Feedwater flow was also oscillating in an attempt to maintain steam generator level. The point in the plant shutdown procedure for tripping the turbine had been reached.

Over a three minute period, all four steam generator levels increased rapidly, which caused reactor coolant average temperature to decrease to approximately 542 degrees F. This reduction in reactor coolant temperature caused reactor power to increase from approximately 5% to approximately 10%, due to the negative moderator temperature coefficient.

When the turbine was manually tripped, the reactor tripped when reactor power increased to the Power Range Permissive P-10 setpoint (two out of four power range channels above 10% power). All plant systems responded normally following the reactor trip.

The two contributing root causes to this event were personnel error and procedure deficiency. The personnel error included the manual turbine trip

while reactor power was increasing to the P-10 setpoint (turbine trip/reactor trip not blocked), and poor control of feedwater flow which caused reactor power to increase from 5% to 10% in 2 minutes.

A procedure deficiency also contributed to the personnel error. Due to the instability of feedwater flow, power should be monitored more closely while taking the turbine off line. Currently, the unit operator is required to verify reactor power below P-10 only once, and then perform a number of intermediate steps prior to tripping the turbine. Therefore, a significant time delay could occur between verifying P-10 and actually tripping the turbine.

(End of Abstract)

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#### A. CONDITION PRIOR TO EVENT

MODE 1 - Power Operation RX Power 10%  
RCS (AB) Temperature/Pressure 542.6 degrees F/2184 psig

#### B. DESCRIPTION OF EVENT

On July 23, 1988, Unit 1 was being shutdown per Plant Shutdown General Operating Procedure (GOP) 4. At 00:40, turbine and reactor power were both at approximately 5%, steam generator levels were at the low point of a diverging oscillation (Figure 1), and reactor coolant average temperature was approximately stable at 549 degrees F. Feedwater flow was also oscillating in an attempt to maintain steam generator level. The point in the plant shutdown procedure for tripping the turbine had been reached.

Between 00:40 and 00:43, a feedwater transient caused all four steam generator levels to increase rapidly, which caused reactor coolant average temperature to decrease to approximately 542 degrees F. This reduction in reactor coolant temperature caused reactor power to increase from approximately 5% to approximately 10%, due to the negative moderator temperature coefficient.

When the turbine was manually tripped at 00:43:31, the reactor tripped when reactor power increased to the Power Range Permissive P-10 setpoint (two out of four power range channels above 10% power). All plant systems responded normally following the reactor trip.

#### C. APPARENT CAUSE OF EVENT

The two contributing root causes to this event were personnel error

and procedure deficiency. The personnel error included the manual turbine trip while reactor power was increasing to the P-10 setpoint (turbine trip/reactor trip not blocked), and poor control of feedwater flow which caused reactor power to increase from 5% to 10% in 2 minutes. Feedwater flow is difficult to control at low power levels, and the reactor trip would have been avoided if the turbine was tripped at 00:41.

The procedure deficiency, which contributed to the personnel error, involves GOP 4. Due to the instability of feedwater flow, and subsequently reactor power, at low power levels, reactor power should be monitored more closely while taking the turbine off line. Currently, the unit operator is required to verify reactor power below P-10 only once, and then perform a number of intermediate steps prior to tripping the turbine. Therefore, a significant time delay could occur between verifying P-10 and actually tripping the turbine.

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#### D. SAFETY ANALYSIS OF EVENT

This event is reportable because of the automatic actuation of the Reactor Protection System, per 10 CFR 50.73 (a) (2) (iv).

This event did not have any significant safety impact. All safety and control systems responded normally and the plant was brought to a stable hot shutdown condition following the turbine trip/reactor trip. The health and safety of the public was not compromised.

#### E. CORRECTIVE ACTIONS

The corrective action to prevent this event from recurring will be to add a step to GOP 4 to verify that reactor power is less than 10% and stable or decreasing, and to reverify that the P-10 Block is in, immediately prior to tripping the turbine.

#### F. PREVIOUS EVENTS

A STAIRS database search reveals no previous occurrences of this type.

#### G. COMPONENT FAILURE DATA

None

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Figure 1. Steam Generator Levels

FIGURE OMITTED - NOT KEYABLE (GRAPH)

ATTACHMENT # 2 TO ANO # 8808250234 PAGE: 1 of 1

Commonwealth Edison  
Zion Generating Station  
101 Shiloh Blvd.  
Zion, Illinois 60099  
Telephone 312/746-2084

August 17, 1988

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Dear Sir:

The enclosed Licensee Event Report number 88-017-00, Docket No. 50-295/DPR-39 from Zion Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv), which requires a 30 day written report when any event results in manual or automatic actuation of any Engineered Safety feature, including the Reactor Protection System.

Very truly yours,

/s/ ILLEGIBLE  
for G. J. Pliml  
Station Manager  
Zion Generating Station

GJP/ts

Enclosure: Licensee Event Report

cc: NRC Region III Administrator  
NRC Resident Inspector  
INPO Record Center  
CECo Distribution List

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